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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/589,222	05/11/2007	Joseph M. DeSimone	035052/339400	5780

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EXAMINER	
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ART UNIT	PAPER NUMBER
1796	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/589,222	DESIMONE ET AL.	
	Examiner	Art Unit	
	HENRY S. HU	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *Election of April 12, 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-238* is/are pending in the application.

4a) Of the above claim(s) *24-238* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-238* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 May 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This Application **10/589,222** filing on May 11, 2007 is from **371/PCT/ US2005/04421** with a US provisional priority at February 13, 2004. Applicants have elected **Claims 1-23 (Group I) without traverse**, which is in response to Restriction requirement filed on March 12, 2010. **Pre-Amendment** and **six IDS'** (total 17 pages) are filed so far. With such a pre-amendment, only the typographical or grammatical error on claims is corrected, while no claim is cancelled or added (see pages 2-3 of Remarks). Examiner **accepts Applicants' ten-sheet Drawing with Figures 1-10** filed along with this Application (a brief description is on pages **8-9**). **Claims 1-238 with twelve independent claims (Claims 1, 24, 34, 53, 120, 128, 139, 146, 163, 187, 208 and 224) are now pending**, while non-elected Claims 24-238 (Groups II-XII) are all withdrawn from consideration. An action follows. No international search report is found in Applicants' **two** papers including **WO 2005/084191 A2 to DeSimone** et al. and **WO 2005/030822 A2 to DeSimone** et al.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. The limitation of parent **Claim 1** in present invention relates to ***a microfluidic device*** *comprising a perfluoropolyether (PFPE) material, wherein* ***the PFPE material is prepared from a liquid PFPE precursor material*** *having a characteristic selected from the group consisting of:*

(i) ***a viscosity greater than about 100*** *centistokes (cSt),*

(ii) ***a viscosity less than about 100*** *cSt, provided that the liquid PFPE precursor material having a viscosity less than 100 cSt is not a free-radically photocurable PFPE material, and*

(iii) combinations thereof.

See other limitations of dependent ***Claims 2-23****.*

5. **Claims 1 and 23 are rejected** under 35 U.S.C. **102(b)** as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over **Peterson** et al. (**US 6,335,224 B1**) **or** under 35 U.S.C. **102(e)** as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over **Peterson** (**US 6,956,283 B1**, which is a CIP of US 6,335,224 B1)), **Summersgill** et al. (**US 2005/0255003 A1**) or **Chiu** et al. (**US 2005/0048581 A1**).

Applicant has claimed in elected parent **Claim 1** an unexpected way of obtaining **a microfluidic device** comprising a perfluoropolyether (PFPE) material. Said **PFPE material is prepared from a liquid PFPE precursor material** having a property "selected from the group consisting of": (i) **a viscosity greater than about 100** centistokes (cSt), (ii) **a viscosity less than about 100** cSt, provided that the liquid PFPE precursor material having a viscosity less than 100 cSt is not a free-radically photocurable PFPE material, and (iii) combinations thereof. According to MPEP, the scope of perfluoropolyether (PFPE) material or precursor material includes any material as long as it comprises PFPE polymer or PFPE unit-containing polymer.

6. **Peterson (224), Peterson (283, the CIP case), Summersgill and Chiu** each has disclosed a process for protecting a **microelectronics device** during device packaging by using a removable protective coating film on sensitive area. The protective coating film on such a device would ideally be water-insoluble, vacuum-deposited, strong, pure, inert, defect-free, dry-etchable and conformal (see Peterson (224) at column 5, line 7-9). The film is made from a parylene-like precursor vacuum deposition such as CVD or PECVD or made from **a liquid PFPE precursor** For instance, see Peterson (224) at abstract, line 1-21; column 5, line 7-22; column 8, line 1-12; column 11, line 7-9. The microelectronics device may be **microfluidic systems such as used in Chemical-Lab-on-a-chip systems**. See Peterson (224) at **Figure 1A** and column 4, line 55-57; also see the **component 14** to be used as the protective coating in **Figures 1B and 1C**. For other instance, see **Summersgill** for the use of Fluorolink S10, which is a di-triethoxysilane based on **a linear perfluoropolyether** backbone. See paragraph 0089; particularly see line 3 for microfluidic channel walls and line 10-13 for Fluorolink S10. See **Chiu** for the use of liquid perfluoropolyether (PFPE) or its precursors at paragraph 0023; see the application as microfluidic channel at paragraphs 0021-0022.

7. Regarding "liquid state" processing, some viscosity is always required when liquid state processing is used. Therefore, Petersons, Summersgill and Chiu each is only silent about using liquid PFPE material or precursor material carrying the specific viscosity being higher than 100 cSt or being lower than 100 cSt.

8. In light of the fact that the prior art and the present invention recite substantially identical liquid PFPE material or precursor material as well as the purpose to make a protective coating film by liquid state processing, a reasonable basis exists to believe that such a liquid PFPE material or precursor material used by Petersons, Summersgill and Chiu inherently possess the same or at least similar viscosity property. Since PTO does not have proper means to conduct experiments, the burden of proof is now shifted to Applicants to show otherwise. *In re Best*, 195 USPQ 430 (CCPA 1977).

> It has been held that where applicant claims a composition in terms of function, property or characteristic where said function is not explicitly shown by the reference and where the examiner has explained why the function, property or characteristic is considered inherent in the prior art, it is appropriate for the examiner to make a rejection under both the applicable section of 35 USC 102 and 35 USC 103 such that the burden is placed upon the applicant to provide clear evidence that the respective compositions do in fact differ. *In re Best*, 195 USPQ 430, 433 (CCPA 1977); *In re Fitzgerald et al.*, 205 USPQ 594, 596 (CCPA 1980).

9. Dependent **Claim 23** relates to the light transparency of PFPE material, the issue of inherent property is thereby applied for rejecting Claim 23.

10. **Claims 2-14 and 19-22 are rejected** under 35 U.S.C. 103(a) as being unpatentable over **Peterson** et al. (US 6,335,224 B1), **Peterson (US 6,956,283** B1), **Summersgill** et al. **(US 2005/0255003 A1)** and **Chiu** et al. **(US 2005/0048581 A1)** in combination or alone, in view of **DeSimone** et al. (US 2006/0083971 A1 with a US provisional priority at January 23, 2004).

The discussion of the disclosures of the prior art of Petersons Summersgill and Chiu for Claims 1 and 23 of this office action is incorporated here by reference. Regarding **Claims 2-14**

and 19-22, Peterson (224), Peterson (283), Summersgill and Chiu in combination or alone is silent about **two** things including: (A) using the functionalized PFPE precursor as disclosed in Claims 2-14 and 19-22, and (B) the motivation to do so. **DeSimone (971) along with the references cited therein** can teach such two subject matters.

11. For one instance, in the course of using liquid materials for making electrochemical cells such as microfluidic electrochemical cell, a liquid type photocurable perfluoropolyether (PFPE) as precursor material can be used. By doing so, the advantage is that such a liquid process is processable and convenient. See title; abstract; paragraphs 0001-0007. Also see the use of many varieties of PFPE precursors throughout the specification.

12. With such an advantage, the skilled artisan would make the obvious connection to apply such two subject matters as described by DeSimone into Petersons, Summersgill and Chiu's microfluidic device.

13. **Claims 15-18 are rejected** under 35 U.S.C. 103(a) as being unpatentable over **Peterson** et al. (US 6,335,224 B1), **Peterson (US 6,956,283** B1), **Summersgill** et al. **(US 2005/0255003 A1)** and **Chiu** et al. **(US 2005/0048581 A1)** in combination or alone, in view of **two** references including **Weers** et al. (US 6,204,296 B1) and **Linert** et al. (US 6,737,489 B2).

The discussion of the disclosures of the prior art of Petersons Summersgill and Chiu for Claims 1 and 23 of this office action is incorporated here by reference. Regarding **Claims 15-**

18, **Peterson (224), Peterson (283), Summersgill and Chiu** in combination or alone is silent about **two** things including: (A) using a **two-component PFPE precursor system**, which comprises a mixture of **two functionalized PFPE components** blended in a stoichiometric ratio, and (B) the motivation to do so. **Two** references including **Weers and Linert** in combination can teach such two subject matters.

14. For one instance, **Weers** teaches that PFEB (**perfluoropolyether bromide**, which is falling in the same scope of "functionalized" PFPE) can be particularly used together with regular liquid PFPE or its precursor. By doing so, the advantage is to better stabilize fluorocarbon emulsion (column 13, line 43-49). For the other instance, **Linert** also teaches that a fluorochemical composition may comprise a linear PFPE-containing polymer with other fluoropolymer (see paragraphs 0027-0034 and 0036-0037; particularly see paragraph 0029, line 10-11). By doing so, the advantage is that such a composition can be very useful for rendering a fibrous substrate oil and/water repellent (abstract, line 1-10).

15. With such an advantage, the skilled artisan would make the obvious connection to apply such two subject matters as described by Weers and Linert into Petersons, Summersgill and Chiu's microfluidic device.

Conclusion

16. Any inquiry concerning this communication or earlier communication from the examiner should be directed to **Dr. Henry S. Hu whose telephone number is (571) 272-1103**. The

examiner can be reached on Monday through Friday from 9:00 AM –5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Vasu Jagannathan, can be reached on (571) 272-1119. The **fax** number for the organization where this application or proceeding is assigned is **(571) 273-8300** for all regular communications. Information regarding the status of an application may be obtained from the Patent Application. Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Peter D. Mulcahy/
Primary Examiner, Art Unit 1796

/Henry S. Hu/
Examiner, Art Unit 1796

June 11, 2010